REMARKS

These remarks are in reply to the Office Action mailed September 18, 2008. Claims 1, 3-10, 12-15, 23 and 24 were pending in the Application prior to the outstanding Office Action. In the Office Action, the Examiner rejected claims 1, 3-10, 12-15, 23 and 24. Reconsideration of the rejections is requested.

I. Claim Rejections under 35 U.S.C. § 103

1. Claims 1, 3-7, 9, 10, 12-15, 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Selitser* in view of either *Fincke et al.* or *Gorynin et al.* Applicant respectfully traverses the rejection.

The Examiner writes that "*Selitser* teaches the claimed subject matter for the reasons set forth on page 2 of the prior office action, but does not set forth the surface modification tool as comprising a flame torch using combustion. Both patents to *Gorynin et al.* and *Fincke et al.* are cited for disclosing flame torches, which cause reactive interaction with substrates, used to modify the surfaces of the substrates."

Goyrnin does not teach a flame torch. While a flame is a plasma (i.e., its state of matter is classified as plasma), a plasma is not necessarily a flame. A flame requires combustion. (Flame is defined as "burning gas or vapor, as from wood or coal, <u>that is undergoing combustion</u>; a portion of ignited gas or vapor" (Emphasis added). See Dictionary.com.) *Gorynin* uses the term "flame" to describe the plasma discharge at the end extending from the tool, but the discharge is not a product of combustion. *Gorynin* repeatedly refers to a "plasma torch flame." The only specific plasma flame described is given in EXAMPLE 1, where *Gorynin* describes "The thermally reactive powders were introduced into the plasma torch at a distance of 40 mm from the base of the plasma flame torch. The adhesive layer was deposited in an inert atmosphere using a high velocity <u>***argon***</u> plasma torch with a plasma escape rate of 800+- 50m/s" (Emphasis added). See col. 5, line 64-col. 6, line 2. As is well known, argon is inert and non-combustible. Argon has a flammability rating of zero and is even used to extinguish fires where damage must be avoided. Nowhere does *Gorynin* teach or suggest combustion.

Fincke does not teach a flame torch. *Fincke* teaches a plasma device. *Fincke* does disclose that "The fast quench reactor and method of operation described herein take advantage of the high temperatures (5,000° to 20,000° C) available in a high temperature heating means such as a thermal plasma device…The fast quench reactor and method of this invention shall be described and illustrated forthwith in terms of a rapid heating means comprising a plasma torch and a stream of plasma arc gas. However, it will be recognized that the rapid heating means can also include other rapid heating means such as lasers, and flames produced by oxidation of a suitable fuel, e.g., an oxygen/hydrogen flame." *Fincke* includes a list of alternative heat sources, but the list is defective and would be readily recognized as such by one of ordinary skill in the art. No current combustion flame is capable of reaching the high temperatures required of *Fincke.* Dicyanoacetylene burned in oxygen is the hottest flame of any chemical at a temperature of 4987 °C,

according to *Guinness World Records*, short of the 5,000° to 20,000°C specified by *Fincke*. See http://en.wikipedia.org/wiki/Carbon_subnitride. Oxygen/hydrogen flames, expressly cited by *Fincke*, reach much lower temperatures. For example, oxyhydrogen burns at a maximum temperature of about 2800°C. *Fincke* also teaches a reaction chamber downstream from the plasma chamber. These two sections of the apparatus are separate and distinct. The reaction chamber (Fig 1, 16) is where the desired end products are produced as the feedstock gases that have been completely dissociated in the high temperatures of the torch section (Fig 1, 12) begin cooling and reacting with other gases introduced into the injector section (Fig 1, 14). The temperature of the reaction chamber (1700°C – 4000°C) is necessarily lower than the temperature of the torch section (5000°C - 20000°C). The lower temperatures discussed for the reaction chamber are dependent on the design of the apparatus, and not the torch section, which is much hotter. *Fincke* describes use of alternative heat sources briefly and without elaboration; however, based on the specifications cited and process taught by *Fincke*, combustion is not a suitable heat source to thermally convert one or more reactants to desired end products using the apparatus disclosed therein. Therefore, one of ordinary skill in the art would not apply the teachings of a oxygen/hydrogen flame as taught by *Fincke* to generate a reactant stream.

Still further, *Fincke* cannot be combined with *Selitser*, and teaches away from "a second source of a reactive precursor that transforms in the presence of the flame to a reactive species that chemically combines with the contaminant." *Fincke* teaches that reactants (Fig. 1, arrow 30) are injected into a side port ("the injected stream of reactants is preferably injected normal (90° angle) to the flow of the plasma gases" see col. 9, lins32-35) and vaporized to break apart molecular species to their atomic constituents so that they recombine to form end products at the reaction chamber. The end products are collected as they exit the apparatus. *Fincke* teaches away from "A tool for removing a contaminant from the surface of a workpiece, comprising a torch including …a second source of a reactive precursor that transforms in the presence of the flame to a reactive species that chemically combines with the contaminant" as recited in claim 1 and 3. *Fincke* does not teach producing reactive species from a precursor, but rather teaches producing an end product from reactive species. Applicant submits that *Selitser* in view of *Gorynin* and *Fincke* fails to disclose a flame torch, "which cause reactive interaction with substrates, used to modify the surfaces of the substrates." Further, Applicant submits that *Fincke* is not properly combinable with *Selitser*. Because *Selitser* in view of either *Fincke* or *Gorynin* fails to teach all of the features of claims 1 and 3, *Selitser* in view of either *Fincke* or *Gorynin* cannot render claims 1 and 3 obvious under 35 U.S.C. 103(a). Dependent claims have at least the features of the dependent claim from which they depend; therefore, *Selitser* in view of either *Fincke* or *Gorynin* cannot render claims 4-7, 9, 10, 12-15, 23 and 24 (which ultimately depend from claim 3) obvious under 35 U.S.C. 103(a).

2. Claim 8 stands rejected under 35 U.S.C. 103(a) as being unpatentable over *Selitzer* in view of either

Finche et al. or *Gorynin* et al. and further in view of *Wagner*. Applicants respectfully traverse the rejection.

For the reasons given above, *Selitser* in view of either *Fincke* or *Gorynin* cannot render claims 1 and 3 obvious under 35 U.S.C. 103(a). *Wagner* fails to remedy this deficiency. Since *Selitser* in view of either *Fincke* or *Gorynin* in further view of *Wagner* cannot render claim 8 (which depend from claim 1) obvious under 35 U.S.C. 103(a).

II. Claim Rejections under 35 U.S.C. § 102

Claims 1, 3-7, 9, 10, 12-15, 23 and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by *Selitzer et al.* Applicant respectfully traverses the rejection.

The Examiner writes that "Figures 2a and 6a in *Selitzer et al.* teach an inductive plasma torch, with nested components, capable of directing a plasma gas which is flammable, if desired, such limitation comprising intended use of the apparatus and not patentably limiting."

Applicant submits that a reference must disclose each and every feature of a claim in order to anticipate the claim under 35 U.S.C. 102(b). Applicant submits that *Selitser* fails to disclose either "a first source of combustible process gas; an outer tube connected with the first source" or "a second source of a reactive precursor…an inner tube nested within the outer tube and communicating the reactive precursor" as recited claims 1 and 3. Applicant submits that "a first source of combustible process gas" and "a second source of a reactive precursor" are structural limitations and therefore patentably limiting.

Because *Selitser* fails to disclose all of the features of claims 1 and 3, *Selitser* cannot anticipate claims 1 and 3 under 35 U.S.C. 102(b). Dependent claims have at least the features of the independent claims from which they depend; therefore, *Selitser* cannot anticipate claims 4-7, 9, 10, 12-15, 23 and 24 (which ultimately depend from claim 3) under 35 U.S.C. 102(b).

III. Conclusion

In light of the above, it is respectfully submitted that all of the claims now pending in the subject patent application should be allowable, and a Notice of Allowance is requested. The Examiner is respectfully requested to telephone the undersigned if he can assist in any way in expediting issuance of a patent.

The Commissioner is authorized to charge any underpayment or credit any overpayment to Deposit Account No. 06-1325 for any matter in connection with this response, including any fee for extension of time, which may be required.

Respectfully submitted,

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